

ABSTRACT:

The present invention describes a device for performing breast biopsies and/or therapy within magnetic resonance imaging (MRI) systems. The apparatus includes a RF receiver antenna for magnetic resonance imaging of the breast. The RF coil includes openings in the front and side to provide access to the breast during the procedure. Compression plates are integrated into the breast coil which compress the breast either laterally or in the head/feet direction as required for optimal access to the breast. The apparatus includes a mechanical device for positioning interventional instruments in the breast such as biopsy or therapy instruments. The mechanical positioning devices position the instrument along the desired trajectory to the target site and insert the instrument into the breast while the patient remains inside the MRI scanner. Real time MR images may be acquired during instrument alignment and insertion to verify the trajectory. The mechanical positioning devices allow manipulation of instruments in any type of MRI scanner, including high field MRI systems with cylindrical magnets. The positioning devices provide a means to overcome limited access to the patient in MRI scanners. The positioning devices may be manually operated by means of gears, drive shafts, cables or other mechanical means. Or they may be electronically controlled by means of MR compatible motorized drive systems. The devices may be remotely controlled from outside the magnet for MRI systems that have limited access to the patient in the magnet. An interface between the electronically controlled drivers and the MRI scanner computer can provide robotic control of the instrument.

28 CLAIMS, 5 DRAWING SHEETS